INSTRUCTIONS

for

TI-PWRITER

TI-PWRITER is a powerful tool for developing and printing text and documents. As with any powerful, versatile tool, carefully reading the instructions and performing a few experimental practice projects will best acquaint you with its full range of features.

There are many ways to approach text manipulation, especially if the program is written in assembly language. But using assembly language requires purchasing additional equipment and restricts future modifications to those who understand that language.

We have found (after a tremendous amount of work and many modifications) that a very good job can be done just using Extended Basic. However, Extended Basic does impose a few constraints which, hopefully, will be conceded. Available memory is more quickly consumed, so adding too many features will severely limit the amount of text that can be worked on at one time.

TI-PWRITER usually allows you to see the last 18 screen lines of text for easy referencing as you type. Formating instructions (TAB, MARGIN, etc.) are visible right in the text. The ability to specify the length of a print line will help in formating a document. For example, if you print two pages of a document using 60 characters per line and then find that only two print lines overlap onto a third sheet, you might want to make the lines 64 or 66 characters wide and get the whole document on two sheets of paper (or one sheet, both sides). This can all be done with one input in the print section with TI-PWRITER.

Since TI-PWRITER is designed for a wide variety of applications, reviewing the instructions after a few uses will make them more apparent. (These instructions were printed on an Epson MX100 using TI-PWRITER.)

Some definitions of terms used in the these instructions are shown on the last page of this manual. We suggest you read through them before continuing.

Using TI-PWRITER

You may directly enter any 28 characters per screen line, 20 lines per screen, up to six screens (about 3600 characters or one 8 1/2"X 11" sheet of paper - 42 eighty character lines). The text in the screen lines is continually strung together with all trailing spaces dropped and one space inserted between lines. All intervening print controls are functioned then removed. Thus, if the screen looks like this:

```
The
quick brown
fox
jumps over the
lazy dog.
```

The printer will print:

The quick brown fox jumps over the lazy dog.

When you specify a line length (in Print Mode) the last full word at that length will complete that print line. It is not necessary to hyphenate or know where the end of a line is. A print line can be from 28 to 254 characters long (limitted by printer capacities).

Any part of the text may be edited at any time by cursor control. Using Extended Basic allows only upper case key entry from the keyboard but the TI-PWRITER program will interpret these into upper and lower case. Any text in the console may be stored (Saved) on cassette or diskette for subsequent editing, continuation or printing. Text may be printed on a T.I. Thermal Printer or through an RS232C serial interface. Full software control of the printer is available depending on the printer's capabilities of using specia characters. These often include features like enhanced or expanded print, form feed, and carriage return only (for print-overs like underlining). Or text may be formatted (printed) on the screen for viewing of its structuring. A single line, a portion of a page, or an entire page may be test printed.

A Few Major Instructions:

Although the full flexibility of TI-PWRITER will become apparent as you use it, during your initial trials these major instructions will usually get you "unstuck" if you aren't sure what to do next:

Depressing the "ENTER" key twice (two consectuive inputs of null) will return you to the Main Menu with no loss of text (except where you are precautioned by a screen prompt). Often a single null entry will suffice. From the Main Menu you can access any function or return to where you were.

If you should type in an incorrect entry at a prompt, the ERASE key (Shift-T or Function-3) will clear that line for correction or null entry.

The AID key (Shift-A or Function-7) while in the Edit Mode will display edit key and print control prompts at the bottom of the screen.

It is usually best, while learning, to Save your text frequently or at least before performing major editing or printing tasks. The improved or perfected copy can then replace it when you have it finished.

Should you have an error in operation (such as an erroneous print control in a screen line), you will receive an error handling screen with a code number on it. These code numbers are expalined in the Appendix of you Extended Basic Handbook. By selecting the appropriate option, you will return to the Main Menu without loss of text.

Operation of TI-PWRITER:

You have received four programs which are identified on the diskette as:

DSK1.TI-PWRITER
DSK1.DOCUMENT
DSK1.PRINT
DSK1.MEMORY_X

These are arranged on cassette in the same order.

There are also two files called TEST-1 and TEST-2. These are to demonstrate the text appearance and structure and printing (discussed later).

The reason for the three programs is to allow you the greatest amount of text input and printing considering the limitations of a 16K random access memory. With a disk attached under normal operation, only about 11K RAM is available. (You should use the maximum capacity of TI-PWRITER by entering: NEW, CALL FILES(2), NEW, before loading the program.) Since the cassette version does not lose so much memory, they will usually be able to get by with the full program.

The assets of the programs are as follows:

TI-PWRITER: will allow you to develope a document, edit it completely, interpret it to upper and lower case, and print or save it on diskette or cassette. But because of its size, it will allow only 80 screen lines of input with a disc or 120 lines with a cassette.

DOCUMENT: may be used to develope up to 120 screen lines with disk or 160 lines with cassette. It is a portion of the TI-PWRITER program which allows you to enter and edit a larger document. Before transferring to the PRINT program it will be necessary to Save the text and Input it after the other program is in the console. (With disk, menu items 5 and 6 will precaution you to save your text then will automatically load and run the PRINT program.)

PRINT: is the other half of the TI-PWRITER program and will interpret upper and lower case print and will print the document on a screen or a printer (up to the number of screen lines that this half can hold).

MEMORY_X: will hold up to 300 screen lines of text.

It is suggested that you work with the complete TI-PWRITER program until you are very familiar with its operation before proceeding to the greater capacity of the other two programs.

When the TI-PWRITER program is loaded and "RUN" the title screen will appear while a number of variables are established with disk, leave the program diskette in the drive until the variables are read in). Then you will be asked "Do you have a 99/4A?". Entering "Y" will set up operation for a 99/4A and any other entry will be the equivilent of "N".

Then the Main Menu will appear. From the Main Menu you can access any of the TI-PWRITER functions. You should remember that any entry of null at an input will return you to this menu. The Main Menu looks like this:

```
                TI-PWRITER
                MAIN MENU
            (COMPLETE PROGRAM)

        1=DOCUMENT MODE
        2=INPUT DOCUMENT
        3=CONTINUE MODE
        4=SAVE DOCUMENT
        5=PRINT DOCUMENT
        6=INTERPRET CAPITALS
        7=LEAVE PROGRAM

        CHOICE?
```

The purpose of each of these modes of operation is:

DOCUMENT MODE: Choose item #1 to begin a new document (letter, memo, form, etc.). You will be precautioned that this will remove any text already in the console (a clean slate to work on). Depressing the space bar will take you forward and when the cursor appears, you may begin to type. Each screen line will be linked to the previous line with one intervening space. Print control characters, if there are any, must be placed at the beginning of a screen line and they will be removed during printing. Capital letters must be indicated by using a caret (shift-J=^). These will be explained in the next section of the instructions. You might want to test the operation of this mode by typing a few lines then enter a null (or depress "ENTER" twice while in a screen line). You will return to the Main Menu. The CONTINUE MODE (item #3) explained below will return you to the text for more typing.

Input Document: Selecting item #2 will allow you to input a document stored on cassette or disk. You will be precautioned that the input will remove any document in the console. You will see this screen:

```
        >>>>INPUT DOCUMENT<<<<

        ENTER NULL FOR MAIN MENU



            OPEN #1:

        ENTER DEVICE OPEN STATEMENT
        (CS1, DSK1.FILENAME, TP.E,
        RS232.BA=600.EC, ETC.)
```

If, at this point, you realize that you do not wish to INPUT, you can still return to the Main Menu by entering a null at the OPEN #1 input.
Otherwise, enter the devise open statement that is used with the device you are using. The other parameters, such as INPUT ,INTERNAL, etc., will be linked to your device statement, so it is only necessary to enter the device name. Quotes are not necessary. Examples are shown at the bottom of the screen (CS1, DSK1.MYFILE, etc.). If you make a typing error, use ERASE (shift-T or F-3) to null it and re-type. If you receive an Error Screen, choose #1 to close the devive. You will return to the Main Menu to try again.

As the input proceeds, the number of complete screens ("S=") and total lines ("L=") will be shown and updated. Holding down "ENTER" will stop the input on the next cycle. (This is useful if, for instance, you want to check the first few lines of a document to verify that it is the one you are looking for.)

Cassette: By entering "CS1" (no quote marks) you will generate the normal sequence of instructions built into T.I. Basic for cassette loading. Please note that these instructions allow about 10 seconds of empty tape to pass (to create a leader) before actually recording or reading. When the screen shows >HOLD DOWN 'ENTER' TO STOP<, recording or reading will begin. When it is completed you will return to the main menu.

Disk: By entering the device and file name (and disk name if you wish) you will access the diskette (such as (DSK1.LTR#2 or DSK3.MYDISC.LTR_TO_MOM).

Continue Document: Selecting menu item #3 will allow you to continue working on a document already in the console. If you are not sure which is the last screen you were working on, select #1 then the UP arrow (shift-E or F-E) to get into the EDIT Mode. Then BEGIN (shift-W or F-5) will allow you to continue your document. (This will be explained in EDIT, below.)

Save Document: Selecting #4 will give instructions similar to Input Document (#2 above).

It is strongly recommended that you identify the document saved as follows:

Cassette: At the instruction to "Rewind (reposition) Cassette", you should remove the microphone plug (red wire) and record, in voice, the name of the document. Re-insert the plug, then proceed with recording.

Disk: Use a significant name for the file (such as DELINQ1, DELINQ2, and DELINQ3 for dunning (delinquency notice) letters of increasing intensity).

About 56,000 characters or 2000 screen lines of text can be saved on a 40 track diskette or 60 minute cassette tape. For a multi-page document, it is recommended that you identify the sections as Part 1, 2, 3, etc. For example, if you were writing a research paper, on cassette you might say "Research, Part 1", etc. or on a disk use "DSK1.RES P1". The prompt at the end of the print section, DO YOU HAVE MORE OF THIS DOCUMENT TO PRINT? Y/N, will hold the segment of a line while inputing the rest of the document. (If you choose "N" there, it will print that last line at that time.)

Print Document: Since Menu item #5 is the ultimate goal of most of the text generated, it allows you the greatest flexibility by giving you numerous choices in the set-up. (It is recommended that you always save the text before printing it.)

Upon selecting #5, you will be given a screen that shows:

PRINT ON:
1) SOLID STATE PRINTER (T.I.)
2) RS232C
3) SCREEN

#1 and #2 will allow you to access the printer by inputing the controls that you want (such as "TP.E" or "RS232.BA=1200.LF" or the like (quotes not required). #3 allows you to see the formating and check for capitol letters. Having chosen one of these you will be receive a screen that shows:

BEGIN AT SCREEN #:
LINE #:
INTERPRET CAPITALS Y/N:
OF SPACES IN MARGIN:
OF CHARACTERS/LINE:
OF LINES/PAGE:

The first two inputs allow you to start printing at a certain place in the document (to test print it or extract a section) by specifying the screen number and line number on that screen that you wish to start your printing.
If you wish to convert your text to upper and lower case, enter Y at the INTERPRET CAPITALS prompt.
The last two inputs set the margin (by inserting spaces) and the length of the print line.
OF LINES/PAGE will cause the printer to halt at the end of that number of printed lines (to allow you to change single sheets or skip perforation).
Even if you screen print an 80 character line, you will be able to see the formating by taking into account the 28 character limitations of the screen.

Interpret Capitals: Main Menu item #6 allows you to interpret the text directly in your screen lines. However, since you cannot enter lower-case letters into that text, this should only be done after you have proof-read the text and do not intend to make any changes in it. Print Control changes can still be made and some upper and lower case changes can be made using the "?I" expained below in "Print Controls".

This is useful when a document will be printed a number of times or periodically and you wish to save the time of interpretting capitals during printing.

Leave Program: #7 is a convenient way to complete your use of the TI-PWRITER program.

Editting Text: The Edit Mode is enterred by using the UP ARROW (shift or function E) any time the screen lines of the text are displayed on the screen. The border will turn red, "Edit Mode" will appear in the upper right hand corner of the screen and the cursor will move to the left of the text. WHILE THE CURSOR IS TO THE LEFT OF THE TEXT, the following special keys may be used:

AID (shift-A or F-7): will present two lines of reminder prompts at the bottom of the screen for the special keys and Print Controls. Subsequent accessing of AID will present additional reminder prompts. This, hopefully, is handier than keeping notes taped to your console.

INSert (shift-S or F-2): will present the five screen lines preceding the cursor, ten empty lines, and the five screen lines following the cursor. The cursor will appear at the beginning of the ten empty lines for insertion of up to ten lines of text. Operation will be the same as normal text input but edit will not be available until you return to the regular text. Entry of a null will complete the insertion of these lines and return to the place of insertion (all empty lines will be ignored).

ERASE (shift-T or F-3): will remove from memory the screen line to the right of the cursor and after a short pause, will present the cursor at the same position on the screen with the designated line removed. (CAUTION! ERASE alone, while the cursor is IN the screen line, will remove the characters but will leave an empty line in the console which will interfere with printing the document. If this should happen, position the cursor at the empty line and use ERASE to remove it.

PROC'D or CMD (shift-V or F-6): will bring to the screen the next full screen of text. The UP ARROW will then move the cursor out to the left of the text for editing

BACK (shift-Z or F-9): will bring to the screen the

previous screen of text (the reverse of PROC'D).

BEGIN (shift-W or F-5): will present the last screen of text and position the cursor on the next available line so you may begin typing the rest of your document.

ENTER: will return you to the Main Menu. If you do this by accident, you may return to the line you were working on through the CONTINUE MODE, selection #3.DOWN Arrow (shift-X or F-X): will let you move down the screen. (NEVER GO DOWN PAST THE ROW OF CARETS "^^^^^^^^^^^^^^^^" OR THE END OF THE DOCUMENT.)

(Remember that the UP ARROW will put you into EDIT MODE and BEGIN will get you out of Edit Mode and let you begin typing more of the document.)

RIGHT Arrow (shift-D or F-D): Will put the cursor into the text for editing of that screen line. By using the shifted keys directly, as specified in the T.I. Users Reference Book. The ARROWs (D, E, S, and X) will function by moving the cursor in the indicated direction. DELete, INSert, and ERASE (shift-F, G, and T or F-1, 2, and 3, respectively) will work normally on the screen lines just as they do when editing program lines.

PRINT CONTROLS: Software (program) control of the printer is all-important since this is the normal goal of the program. The maximum of printer control has been allowed using the following Print Control characters (the "at" symbol ("@") is required where shown and may only be used AT THE BEGINNING OF A SCREEN LINE or IN TANDEM with other "@" print controls (i.e. - @L @L @T005 >>>text<<<). A SPACE MUST ALWAYS FOLLOW AN "@" PRINT CONTROL, and text may follow print controls on the same line. SEE the TEST-1 and TEST-2 documents included with this program. (If you do not enter text on the line with the print controls, remember that a space will be inserted. See "@0" below.)

"^" (the caret): placing a caret before an upper-case character (as is only available on a 99/4) will cause that character to remain in upper-case when the document is printed using the print option "INTERPRET CAPITALS".

"@C (CENTER): will automatically center (using spaces) the preceding print line (back to the last "@N"). This should always be used in the following form:

```
@N >> Line to be centered <<
@C >> Continue text <<
```

For some reason, the various printers handle enlarged print in different ways; some count each enlarged character as double the space of a single character, others count it as a percentage of a single character. Some count the margin characters, some do not. You will either have to experiment with your printer or use the @Tab to center enlarged print.

"@L" (LINE FEED): will skip a line on the printer.

"@Mxx,xxx"(MARGIN, CHARACTERS/LINE): will change the margin in relation to the option that was input for the margin in Print Mode (by adding spaces), and the number of characters per print line as specified after the comma (two digits, a comma, and three digits are required after the "@M" control).

> For example: If you choose a five space margin upon entering the print mode and 75 characters per line on an 80 character/line printer and you wish to indent the paragraph of text by five more spaces you would use @M05,070 at the time of beginning that paragraph and @M00,075 to reset it in the first screen line following the paragraph. The @M print control was used to indent this paragraph. The preset five space margin would remain, and print would be reset to that margin.

"@N"(NEW Print Line): will complete the previous print line and start a new print line (such as at the end of a paragraph).

"@I" (INTERPRET that line only): if you have INTERPRETED YOUR TEXT using Main Menu selection #6 and then find that you need to correct a line that has lower case letters, the @I will allow you to do this. Since you will answer the "INTERPRET CAPITALS Y/N" with a "N", the @I will instruct the program to go into the Interpret section for just that screen line before printing it. That means that all capitol letters in that screen line NOT PRECEDED BY A CARET (^) will be changed to lower case. Thus, if your SCREEN LINE looked like this:

Deer Mom,

you would only be able to correct it to this:

DeAr Mom,

because you can only enter capital letters. If you change your screen line to read:

@I ^DeAr ^Mom,

the D and the M would not be changed to lower case but the A would print as a small "a". Of course, if you forgot to capitalize a letter, you may just type in the capital letter and it will remain capitalized. The "@" print controls will not be affected so they can be added or removed as necessary. The "@I" must be the last (or only) print control before the text.

"@O" (OMIT space): a single space is retained at the end of each screen line. If you wish to omit that space, start the next line with "@O" (the letter "O", not zero) and a space and the print line will link the two screen lines with no space.

"@P"(input PROMPT): will halt the printing process for you

to input on the screen a line of text. "@P" will prompt the rest of that screen line during printing, will accept and print up to one row of input but omit that prompt.

For example, if your screen lines read:

```
September 30, 1981
@L @P NAME
@N @P ADDRESS
@N @P CITY, STATE ZIP
@L @L Dear
@P FIRST NAME WITH A COMMA
```

You will be able to input during printing the name and address and greeting of a letter.

"@Sxxx" (SPECIAL character): will allow you to use special characters for software control of your printer by "printing" CHR$(xxx). Many printers use CHR$(001) for enlarged or expanded print and CHR$(002) to return to normal print. Likewise, you can often access characters per inch, form feed, carriage return without line feed, etc. by "printing" special characters. Please note that enlarged characters normally count each "SPACE" as being enlarged (or doubled) and this will effect margin (@Mxx,xxx), centering (@C) and tab (@Txxx).

"@Txxx(TAB): will tab (by adding spaces) the number of spaces you designate before printing. The spaces will be in addition to the margin as set at that time.

"SPACE BAR": you may temporarily halt printing by holding down the space bar during the printing process.

It may appear that interpretting all of these instructions would slow the printer down considerably but we think you will be surprised at its progress. Interpretting each line for capital letters, however, does cause a significant delay, but should be worthwhile in its final effect. To see the difference, select "N" at the print prompt "Interpret Capitals?". See "@I" above for an alternative that may speed up printing.

We hope that you find TI-PWRITER fully functional for your applications. We have tried to build in as much flexibility as possible. However, if you find it too limitting in some respect, we would like to hear your comments. If you have a special application to which you feel TI-PWRITER may be adapted, please feel free to communicate it to us and we will consider modifying the program for you.

If you are not completely satisfied with TI-PWRITER, you may return it within 15 days for a full refund of your purchase price.

Send your comments to:

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Programing Guide to TI-PWRITER

Although Extended BASIC allows programs to be "Saved,Protected", we know that some individual users will want some items attuned specifically to their application. We therefore have allowed it to come to you unprotected. This leaves it vulnerable to illegal copying but we would not feel comfortable if the honest user was restricted at the expense of those who are less honest. The program may be modified to suit your needs but we caution you that it took many hours to write and debug and is relatively sophisticated in certain sections. This guide is provided for those that wish to risk bug-free operation for the convenience of operation. It is written at the level of an experienced programmer with no apologies to the novice, who may find it difficult to understand.

We caution you also to keep the original bug-free copy (which is write-protected) and keep any modified copies separate from the original.

Certain changes can probably be made without much risk. These include:

1) At the DISPLAY AT/ACCEPT AT lines, you may want to insert the prompts specific to you system and ACCEPT them with SIZE(-XX) so that you do not have to input them each time (such as: RS232.BA=4800). Just remember that to get a null so you can return to the Main Menu you will have to use ERASE.
2) Some of the instructions that appear on the screen could be removed, after you are familiar with them, to give you a bit more free memory for text. The AID items in DATA, for instance.
3) You might want to modify the input or output sections so that you can control the files better.
4) Lines 180 and 190 may be removed if you will only be using a 99/4.
5) In the cassette version, the data could be stored on tape and read-in each time, thereby giving you about 700 more bytes of free memory, but at the expense of a longer loading time.

Just remember that each character you type in will more or less reduce the amount of memory for text (key words only take up one byte usually). Use the invisible Main Menu selection #8 to see what the effect of your changes are and modify line 130 to keep from reaching memory full (which will cause you to lose your text).

Here is a broad outline of the sections (and there are sheets attached that list variables, keywords, etc.):

100-

Initialize; 130 should DIM A$() to six more than NL; NL is the upper limit of the screen line inputs and should be about 10 less than memory full or else the memory gets too full to operate smoothly; 160 F$ is used for @T and @M.

500-

Main Menu.

1000-

Document Mode; U=uppermost A$() that has been used; note that NL will limit the number of input strings.

2000-

Input from device; six at a time; M$(9) is used as (EOF) since cassette does not have this feature; 2170 remove null strings and (EOF); 2190 clears balance of memory.

3000-

Continue Mode; 3010 responds to key input in 10020; goes to Document section to continue.

4000-

Save Document; M$(9) is used as (EOF).

4990-

This is the set up to interpret the characters in the A$ array (same as is done before printing but the interpretted string replaces the uninterpretted string without replacing the print controls).

5000-

This is the heart of TI-PWRITER and is so complex that it would take many pages to attempt to explain it; it is delicately inter-related and we suggest that you not adjust its operation; this is not an attempt to keep it safe, we just cannot explain it simply; if you should understand enough of it that you only need one more link explained, write to us without saying "How does ???? work?" and we will try to respond.

7000-

End.

8000-

Edit Mode; you can determine the uses of the even hundred line sections from the key input at 8010 and where it goes to in 8020; by the way, 8530 uses L1 because DISPLAY AT/ACCEPT AT will not work with a calculation in the A$().

10000-

Caution sub.

10100-

Sub to bring up a screen of text.

10200-

Input/Output sub.

10300-

ACCEPT AT sub.

11000-

ERROR sub; this is designed so errors in tandem fall through for self correcting, so think twice before changing it.

30000-

Memory full test (invisible Main Menu selection #8); M$(9) is 28 characters in length so tests as if each line where filled completely with characters (in actual practice, spaces at the end of a string are automatically dropped by the computer, a fact that caused us some grey hairs but was ultimately put to good use).

We would certainly enjoy any suggestions that you might wish to make.

PROGRAM UNIT <MAIN>

STRING ARRAYS

A$()	130	1010	1060	1070	2120	2140	2170	2190
	3010	4145	4150	5150	5160	5220	8210	8280
	8290	8300	8530	8800	10100	30000		
B$()	8240	8250	8290					
M$()	130	140	190	520	540	1030	2010	2140
	2170	4000	4200	5040	5050	5120	5140	5160
	8100	8290	8510	10000	10220	30000		

NUMERIC ARRAYS

H()	4990	5380

STRING VARIABLES

C$	5230	5240	5260	5280	5290	5440	5460	5480
	5510							
D$	5290							
F$	160	5290	5460	5480				
FN$	2100	4100	5130	10208				
I$	10300							
INP$	5440							
PRM$	5440							
S$	5160	5170	5190	5200	5220	5230	5360	5390
	5400	5410	5420	5430	5440	5460	5470	5480
	5490	5500	5510					
S1$	5180	5190	5200	5220	5390	5430		
T$	2010	4000	5040					
W$	5360	5400						
Y$	180	190	5090	5330				
Z$	140							

NUMERIC VARIABLES

A	5090	5180						
C	530	3000	5020	5070	5080	5110	5115	10300
CO	11000	11010						
CP	4990	5030	5130	5290	5300	5340	5410	
D	1020	1040	1050	1060	1110	3010	3020	8010
	8200	8300	8400	8410	8420	8520	8530	8540
	8600	8800	10030					
D1	10100							
F	5190	5200						
I	540	3000	5030	5070	5080	5110	5115	8210
	8220	8230	8240	8250	8260	8270	8280	8290
	10300							

IN	4990	5220	5340	5360				
J	5190	5200	5210	5260	5270	8290		
K	1000	1070	1080	2130	2140	3010	4140	4145
	5150	8010	8020	8030	8240	8250	8400	8420
	8530	8800	10020					
KK	5170	5190	5360	5380	5390	5400		
L	1010	1030	1120	2110	2120	2140	2150	2160
	2170	2180	3000	3010	4130	4145	4150	4160
	4180	5070	5080	5150	5160	5220	5250	8200
	8270	8280	8290	8300	8500	8510	8530	8600
	8700	8800	10100					
L1	8530	8800						
L3	5000	5300	5302					
LI	11000	11010						
LP	5000	5115	5300	5302				
M	540	550	5160	8510	11030	11040		
MG	5100	5290						
N	530	3000	5020	5070	5080	5110	5115	10300
NL	130	1010	1120	2110	2190	4130	5150	
NM	5000	5290	5490					
OS	5230	5420						
P	5260	5270	5280	5290				
PP	530	2200	5330					
R	170	520	530	2190	3000	5020	5070	5080
	5110	5115	10300	30000				
SE	11000							
ST	1070	2130	4140	5150	8010	8240	8420	10020
SW	8100							
TT	5030	5130						
TY	11000	11010						
U	1010	1050	1060	1070	1120	2170	2190	3020
	5160	8270	8290	8300	8700			
V	1000	1120	2000	7000	10000			
W	5360	5370	5380	5400				
X	7000	8200						
Y	5460	5510						
Z	140	150	5110	5240	5260	5270	5480	5490
	8200	8210	8270	8290	8300			
ZL	8200	8290						

BASIC KEYWORDS

# (FILES)	2100	2120	2200	4100	4150	4200	5130	5290
	5340	5410	11050	11060				
::	100	130	140	170	180	500	520	530
	540	1000	1010	1030	1050	1070	1120	2000
	2010	2170	2190	2200	3000	3010	4000	4200
	4990	5000	5020	5030	5040	5070	5080	5090
	5110	5115	5130	5150	5160	5170	5190	5200
	5220	5230	5250	5260	5270	5280	5290	5300
	5302	5330	5340	5360	5390	5400	5410	5420
	5430	5440	5460	5470	5480	5490	5500	5510
	7000	8000	8010	8100	8200	8210	8240	8270
	8280	8290	8300	8420	8530	8600	8700	8800
	10000	10020	10030	10100	10208	10220	10300	11000

	11050	11060	11070	11080	30000			
ACCEPT	180	1060	5090	5100	5330	5440	8240	8800
	10208	10300	11030					
AT	110	180	510	520	540	1010	1030	1050
	1060	1120	2150	3000	4160	5010	5050	5060
	5090	5100	5120	5140	5160	5300	5310	5320
	5330	5440	8000	8100	8200	8210	8240	8290
	8510	8530	8800	10000	10010	10020	10100	10200
	10206	10208	10220	10300	11010	11020	11030	
BASE	130							
BEEP	180	5090	5100	5330	5440	10010	10208	10300
	11030							
CALL	100	140	170	500	540	1030	1070	2000
	2130	3000	4000	4140	4990	5000	5150	8000
	8010	8200	8240	8420	8700	10000	10020	11000
	11080							
CLOSE	2200	4200	5340	11050	11060			
DATA	13000	13010	13020	13030	13040	13050	13060	13070
DIGIT	5100	10300	11030					
DIM	130							
DISPLAY	110	180	510	520	540	1010	1030	1050
	1120	2150	3000	4160	5010	5050	5060	5120
	5140	5160	5300	5310	5320	5440	8000	8100
	8200	8210	8290	8510	8530	10000	10010	10020
	10100	10200	10206	10220	11010	11020		
ELSE	140	1070	1120	2200	3010	3020	5030	5090
	5150	5180	5200	5220	5230	5380	5440	5460
	8030	8100	8250	8400	8410	8600	10020	10300
END	7010							
ERROR	120	11000	11035	11050	11060	11070		
FIXED	2100	4100						
FOR	140	170	520	1010	1040	2110	2170	2190
	4130	5150	5190	5260	8210	8230	8270	8290
	8300	8520	10100	30000				
GOSUB	530	1000	1120	2000	2010	3000	3010	4000
	5020	5040	5070	5080	5110	5115	5240	5302
	5340	5410	5460	5480	5490	5500	8020	8250
GOTO	550	1120	1130	2170	3030	4200	4990	5030
	5190	5220	5250	5270	5330	5350	5360	5370
	5390	5400	5410	5420	5430	5450	5470	5480
	5490	5500	5510	7000	8100	8290	8300	8420
	8550	8600	8700	8800	11040	11050		
IF	140	190	1000	1070	1080	1120	2140	2170
	2200	3010	3020	4145	5030	5090	5130	5150
	5170	5180	5190	5200	5220	5230	5240	5260
	5280	5300	5302	5330	5340	5360	5380	5390
	5440	5460	8010	8030	8100	8210	8250	8270
	8400	8410	8530	8600	10020	10208	10300	
INPUT	2100	2120						
INTERNAL	2100	4100						
NEXT	150	170	520	1010	1110	2160	2180	2190
	4180	5210	5250	5270	8220	8260	8280	8290
	8300	8540	10100	30000				
ON	120	550	5370	8020	11000	11035	11040	11050
	11060	11070						
OPEN	2100	4100	5130					

OPTION	130							
OUTPUT	4100	5130						
PRINT	4150	4200	5290	5410	30000			
READ	140							
RETURN	5280	5305	8100	8400	8530	8600	10030	10100
	10220	10300	11070	11080				
SIZE	5100	8240	8800	10100	10208	10300		
STEP	2110	2170	4130	5260	8270			
TAB	110	510						
VALIDATE	5090	5100	5330	10300	11030			

BASIC FUNCTIONS

&	5190	5200	5230	5290	5440	5460	5480	5510
	10000							
AND	2170	5130	5190	5260				
ASC	5190							
CHR$	110	520	5190	5200	5510			
INT	1030	2150	3020	4160	5160	5480	8510	8600
	8700	10100						
LEN	5190	5240	5280	5460	5480			
OR	2140	3010	4145	5150	8010	10300		
POS	5260	5360	5400					
RPT$	160							
SEG$	5170	5190	5200	5290	5360	5390	5400	5410
	5420	5430	5440	5460	5470	5480	5490	5500
	5510							
VAL	5460	5490	5510	10300				

SUBPROGRAMS

CHAR	100	140						
CLEAR	100	500	540	8200	8700	10000	11080	
COLOR	170							
ERR	11000							
HCHAR	8010	8420						
KEY	1070	2130	4140	5150	8010	8240	8420	10020
SCREEN	500	1030	2000	3000	4000	4990	5000	8000
	10000							
VCHAR	8010	8420						

LINE REFERENCES

500	1000	1070	2200	3010	4200	5090	5350	8020
	10208	10300	11070					
1000	550							
1020	1120							
1030	3030	8030						
2000	550	5330						
2170	2140							

2190	2170								
3000	550								
3010	3010								
4000	550	1130							
4200	4145								
4990	550								
5000	550								
5050	2200	4990	5030						
5150	5150								
5170	5410	5420	5450	5470	5480	5490	5500	5510	
5190	5390	5430							
5210	5190								
5230	5180								
5250	5220	5380							
5260	5240								
5280	5340	5410	5460	5480	5490	5500			
5290	5260	5270							
5300	5410								
5310	5150	5250	5370						
5360	5170					8600			
5380	5360	5400							
5410	5370					8700			
5420	5370								
5430	5370					8800			
5440	5370								
5460	5370					10000			
5480	5370					10010			
5490	5370					10020			
5500	5370					10100			
5510	5370								
						10200			
7000	550								
						10300			
8000	1070	1080							
8010	8010	8020	8030			11000			
8020	3010					11050			
						11060			
8100	8020	8100	8250			11070			
						11080			
8200	8020								
8270	8250					30000			
8290	8270								
8300	8020								
8400	8020	8420	8800						
8500	8020	8410							
8510	3010	8700							

```
 8600          8020  8410

 8700          8020

 8800          8020

10000          1000  1120  2000  7000
10010          5302  8550
10020         10020

10100          8290  8300  8600

10200          2010  4000  5040

10300           530  3000  5020  5070  5080  5110  5115 10300

11000           120 11000 11035 11070
11050         11040
11060         11040
11070         11040 11050 11060
11080         11040

30000           550
```